



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,264	12/21/2001	Raschid Jose Bezama	FIS920010260US1	7876

32074 7590 04/22/2004

INTERNATIONAL BUSINESS MACHINES CORPORATION
DEPT. 18G
BLDG. 300-482
2070 ROUTE 52
HOPEWELL JUNCTION, NY 12533

EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/026,264	BEZAMA ET AL.	
	Examiner	Art Unit	
	Brian L. Mutschler	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>20020211</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “42” has been used to designate both a supply channel and a suitable location (see Figure 4 and page 17, lines 12-14). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
 - a. On page 1 at line 4, the Application No. of the related application should be included in the blank line. It is noted that the Examiner could not locate an application having the specified Attorney Docket No., and the title did not match any applications submitted by the present inventors. If the application has not been filed, the “Related application” section should be deleted, as well as the reference to the related application on page 14 at line 6.

Appropriate correction is required.

Claim Objections

3. Claims 6, 7, 8, 15, and 17 are objected to because of the following informalities:

- a. In claim 6 at line 2, please include the full name of tetramethylammonium hydroxide in addition to the abbreviation TMAH.
- b. In claim 7 at line 4, please delete the second period.
- c. In claim 8 at line 4, please insert the units for the pitch spacing, e.g., inches.
- d. In claim 15 at line 2, please include the full name of tetramethylammonium hydroxide in addition to the abbreviation TMAH.
- e. In claim 17 at line 4, please insert the units for the pitch spacing, e.g., inches.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-11, 14, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "a second of the opposing spray nozzle assemblies comprising a first nozzle for spraying the cleaning agent in a first pattern" in lines 9-11. This limitation is indefinite because a first pattern was already recited in line 7 with regard to the first nozzle of the first of the opposing spray nozzle assemblies. Are the

first patterns the same pattern, or are they different patterns? The same applies to dependent claims 2-11.

Claim 5 further limits the apparatus as having an insulating supply conduit for the second nozzle, which is "of sufficient length so as to create a resistance that is at least an order of magnitude greater than a resistance between the second nozzle and the article" (see lines 1-5). This limitation is indefinite because the function of the conduit is unclear. As recited in claim 1, a power source is electrically connected to the second nozzle and a voltage is applied between the second nozzle and the article. Since the cleaning potential exists between the article and the second nozzle, which is connected to a power source, the functional language recited in claim 5 does not seem to have any function at all. There is no potential supplied between the source of cleaning agent and the second nozzle, nor is there a potential supplied between the conduit and the second nozzle. Therefore, the resistance of the conduit does not appear to limit the apparatus in any way. A similar limitation appears in claim 14.

Claim 7 recites the limitation "the concentration of the TMAH ... is in the range of 0.2 to 2 weight percent, preferably 0.4 to 0.5 weight percent" in lines 1-4. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render

a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 7 recites the broad recitation 0.2 to 2 weight percent, and the claim also recites 0.4 to 0.5 weight percent, which is the narrower statement of the range/limitation. A similar limitation appears in claim 16.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-4, 10-13, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 870 854 A1, herein referred to as EP '854.

Regarding claims 1 and 12, EP '854 discloses an apparatus for cleaning articles comprises a source of a cleaning agent (either alkali aqueous solution or water) and opposing nozzle assemblies (figs. 1 and 2). Each nozzle assembly comprises a plurality of nozzles, including nozzles **1, 2, 4, 5**, wherein nozzles **1** and **2** are connected to a power source to electrolytically clean the article **S** (col. 4, line 55 to col. 6, line 9). The apparatus further comprises supply lines **1a, 2a** for supplying the alkali aqueous

solution to the nozzles **1, 2** (col. 5, lines 10-14). The other nozzles **4, 5** must also have supply lines to supply cleaning agent to the solution. A transport assembly comprising rollers **8, 9** is used to move the article relative to the nozzles (figs. 1 and 2).

Regarding claims 2 and 3, the nozzles **1, 2, 4, 5** of the assemblies are operable together (figs. 1 and 2).

Regarding claims 4 and 13, the nozzle assemblies comprise rinsing nozzles **4** for spraying cleaning water (figs. 1 and 2; col. 5, lines 25-27).

Regarding claims 10, 11, 19, and 20, the apparatus of EP '854 is capable of cleaning a metallic screening mask that has a metal-containing residue. The article and residue relate to the intended use of the apparatus and do not structurally limit the apparatus. The apparatus of EP '854 is designed to electrolytically clean metal articles using an alkali aqueous solution, and thus, the apparatus is capable of performing the intended use of the instant claims.

Since EP '854 teaches all of the structural limitations recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, 10-12, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey et al. (U.S. Pat. No. 6,032,683) in view of Hogaboom (U.S. Pat. No. 2,307,928).

Regarding claims 1 and 12, Casey et al. disclose an apparatus for cleaning residual paste from a mask, wherein the apparatus comprises a source **16** of cleaning agent (aqueous alkali solution) connected to a plurality of nozzles **52, 52', 56, 56'** of opposing nozzle assemblies via a conduit **20** (fig. 1). A drive system moves the nozzles relative to the mask **24** (fig. 1; col. 4, lines 52-65).

Regarding claims 2 and 3, the nozzles are operable in conjunction with one another (figs. 1 and 2).

Regarding claims 10, 11, 19, and 20, the apparatus is used to clean metal paste material from a metal screening mask (col. 1, lines 12-19).

The apparatus of Casey et al. differs from the instant invention because Casey et al. do not disclose that the second nozzle(s) is/are connected to a power source to apply a voltage between the second nozzle and the article, as recited in claims 1 and 12.

Hogaboom discloses a process and apparatus for electrolytically cleaning articles comprising a plurality of nozzles attached to opposing nozzle assemblies (figs. 1 and 4). Hogaboom teaches, "The improvement in the cleansing action [of electrolytic cleaning] over straight cleaning is believed to be due to several causes, including the formation of free alkali at the cathode, the mechanical action of the hydrogen bubbles on the surface of the cathode tending to lift the oil film and to assist in its emulsification, and the

agitation of the solution, caused by the evolution of gas, which constantly brings fresh solution to the cathode surface" (p. 1, col. 1, lines 1-17). Hogaboom further teaches that the electrolytic cleaning process is made "more rapid and efficient by supplementing the effects of the usual process by a vigorous mechanical action brought about by throwing a forceful stream of cleaning solution against the metal" (p. 1, col. 1, lines 18-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Casey et al. to use a power source to provide electrolytic cleaning as taught by Hogaboom because the combination of electrolytic and mechanical cleaning "physically tears away the dirt" and a "continuous supply of new solution to the metal surface" (US '928 p. 1, col. 1, lines 23-30).

10. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey et al. (U.S. Pat. No. 6,032,683) in view of Hogaboom (U.S. Pat. No. 2,307,928), as applied above to claims 1-3, 10-12, 19, and 20, and further in view of EPO 0 870 854 A1.

Casey et al. and Hogaboom describe an apparatus having the limitations recited in claims 1-3, 10-12, 19, and 20 of the instant invention, as explained above in section 9.

The apparatus described by Casey et al. and Hogaboom differs from the instant invention because they do not disclose the use of rinsing nozzles to spray a rinsing fluid, as recited in claims 4 and 13.

EP '854 discloses an apparatus for electrolytically cleaning an article comprising nozzle assemblies, wherein the nozzle assemblies comprise rinsing nozzles 4 for spraying cleaning water (figs. 1 and 2; col. 5, lines 25-27).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus described by Casey et al. and Hogaboom to use rinsing nozzles as taught by EP '854 because rinsing nozzles allow the alkali solution to be removed.

11. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 870 854 A1, as applied above to claims 1-4, 10-13, 19, and 20, and further in view of Geissler et al. (U.S. Pat. No. 6,238,529).

EP '854 discloses an apparatus having the limitations recited in claims 1-4, 10-13, 19, and 20 of the instant invention, as explained above in section 7.

The apparatus of EP '854 differs from the instant invention because EP '854 does not disclose that the conduit is insulative, as recited in claims 5 and 14.

Geissler et al. disclose an apparatus for electrolytically treating an article and also disclose a prior art apparatus that uses plastic supply lines to minimize the effect of the anode and cathode (col. 2, lines 7-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of EP '854 to use insulative conduits as taught by Geissler et al. so that the supply conduit will not interfere with the anode and cathode of the electrolytic cleaning system. Furthermore, the use of insulative conduits would have been obvious to one of ordinary skill in the art because insulative conduits avoid the problems of corrosion associated more reactive materials.

12. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey et al. (U.S. Pat. No. 6,032,683) in view of Hogaboom (U.S. Pat. No. 2,307,928), as applied above to claims 1-3, 10-12, 19, and 20, and further in view of Geissler et al. (U.S. Pat. No. 6,238,529).

Casey et al. and Hogaboom describe an apparatus having the limitations recited in claims 1-3, 10-12, 19, and 20 of the instant invention, as explained above in section 9.

The apparatus described by Casey et al. and Hogaboom differs from the instant invention because they do not disclose that the conduit is insulative, as recited in claims 5 and 14.

Geissler et al. disclose an apparatus for electrolytically treating an article and also disclose a prior art apparatus that uses plastic supply lines to minimize the effect of the anode and cathode (col. 2, lines 7-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Casey et al. and Hogaboom to

use insulative conduits as taught by Geissler et al. so that the supply conduit will not interfere with the anode and cathode of the electrolytic cleaning system. Furthermore, the use of insulative conduits would have been obvious to one of ordinary skill in the art because insulative conduits avoid the problems of corrosion associated more reactive materials.

13. Claims 6, 7, 9, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 870 854 A1, as applied above to claims 1-4, 10-13, 19, and 20, and further in view of Chandross et al. (U.S. Pat. No. 5,849,173).

EP '854 discloses an apparatus having the limitations recited in claims 1-4, 10-13, 19, and 20 of the instant invention, as explained above in section 7.

The apparatus of EP '854 differs from the instant invention because EP '854 does not disclose the following:

- a. The cleaning agent is TMAH, as recited in claims 6 and 15.
- b. The concentration of TMAH is in the range of 0.2 to 2 weight percent, as recited in claims 7 and 16.
- c. The concentration of TMAH in the spray of the first and second nozzles is the same, as recited in claims 9 and 18.

Chandross et al. teach a method for electrolytically treating an article using an electrolyte containing TMAH (col. 4, lines 41-57). Chandross et al. further teach that the concentration of the electrolyte solution is not very critical and provide an example of a

range from 0.1 to 5M solution of aqueous alkali solution, which overlaps the claimed range (col. 4, lines 53-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the aqueous alkali solution of EP '854 to use a TMAH-containing aqueous alkali solution as taught by Chandross et al. because TMAH is a known solution for use in electrolytic etching, and the use of a known compound for its known purpose is non-obvious. See MPEP 2144.06. The limitation of claims 9 and 18 recites an intended use and does not further limit the structure of the apparatus.

14. Claims 6, 7, 9, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey et al. (U.S. Pat. No. 6,032,683) in view of Hogaboom (U.S. Pat. No. 2,307,928), as applied above to claims 1-3, 10-12, 19, and 20, and further in view of Chandross et al. (U.S. Pat. No. 5,849,173)

Casey et al. and Hogaboom describe an apparatus having the limitations recited in claims 1-3, 10-12, 19, and 20 of the instant invention, as explained above in section 9.

The apparatus described by Casey et al. and Hogaboom differs from the instant invention because they do not disclose the following:

- a. The cleaning agent is TMAH, as recited in claims 6 and 15.
- b. The concentration of TMAH is in the range of 0.2 to 2 weight percent, as recited in claims 7 and 16.

- c. The concentration of TMAH in the spray of the first and second nozzles is the same, as recited in claims 9 and 18.

Chandross et al. teach a method for electrolytically treating an article using an electrolyte containing TMAH (col. 4, lines 41-57). Chandross et al. further teach that the concentration of the electrolyte solution is not very critical and provide an example of a range from 0.1 to 5M solution of aqueous alkali solution, which overlaps the claimed range (col. 4, lines 53-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the aqueous alkali solution of Casey et al. and Hogaboom to use a TMAH-containing aqueous alkali solution as taught by Chandross et al. because TMAH is a known solution for use in electrolytic etching, and the use of a known compound for its known purpose is non-obvious. See MPEP 2144.06. The limitation of claims 9 and 18 recites an intended use and does not further limit the structure of the apparatus.

15. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 870 854 A1, as applied above to claims 1-4, 10-13, 19, and 20, and further in view of Wee et al. (U.S. Pat. No. 6,383,303).

EP '854 discloses an apparatus having the limitations recited in claims 1-4, 10-13, 19, and 20 of the instant invention, as explained above in section 7.

The apparatus of EP '854 differs from the instant invention because EP '854 does not disclose that the nozzles have a plurality of holes having a diameter of 0.030

inches with a center to center pitch spacing of 0.066 inches(?), as recited in claims 8 and 17.

The size and spacing of holes in a nozzle is a result effective variable that depends on several parameters. These parameters include the spacing of the nozzle and the article, the pressure of the fluid, the viscosity of the fluid, the desired fluid flow rate, etc. An example of holes provided in a nozzle plate is taught by Wee et al., who teach a nozzle plate having a plurality of holes having a diameter of about 0.8 mm to 1.6 mm (0.03 inches to 0.06 inches) and a spacing of about 4 mm to 6 mm (0.16 inches to 0.24 inches) (col. 8, lines 8-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nozzles of EP '854 to use a plurality of holes as taught by Wee et al. and to use holes having the claimed size and spacing because the holes allow the direction and control of the fluid impinging on the article to be treated and the size and spacing is a results effective variable that is dependent on many operation parameters within the skill of one in the art to determine.

16. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey et al. (U.S. Pat. No. 6,032,683) in view of Hogaboom (U.S. Pat. No. 2,307,928), as applied above to claims 1-3, 10-12, 19, and 20, and further in view of Wee et al. (U.S. Pat. No. 6,383,303)

Casey et al. and Hogaboom describe an apparatus having the limitations recited in claims 1-3, 10-12, 19, and 20 of the instant invention, as explained above in section 9.

The apparatus described by Casey et al. and Hogaboom differs from the instant invention because they do not disclose that the nozzles have a plurality of holes having a diameter of 0.030 inches with a center to center pitch spacing of 0.066 inches(?), as recited in claims 8 and 17.

The size and spacing of holes in a nozzle is a result effective variable that depends on several parameters. These parameters include the spacing of the nozzle and the article, the pressure of the fluid, the viscosity of the fluid, the desired fluid flow rate, etc. An example of holes provided in a nozzle plate is taught by Wee et al., who teach a nozzle plate having a plurality of holes having a diameter of about 0.8 mm to 1.6 mm (0.03 inches to 0.06 inches) and a spacing of about 4 mm to 6 mm (0.16 inches to 0.24 inches) (col. 8, lines 8-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nozzles of Casey et al. and Hogaboom to use a plurality of holes as taught by Wee et al. and to use holes having the claimed size and spacing because the holes allow the direction and control of the fluid impinging on the article to be treated and the size and spacing is a results effective variable that is dependent on many operation parameters within the skill of one in the art to determine.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 4,162,952 Tribout

U.S. Pat. No. 4,569,695 Yamashita et al.

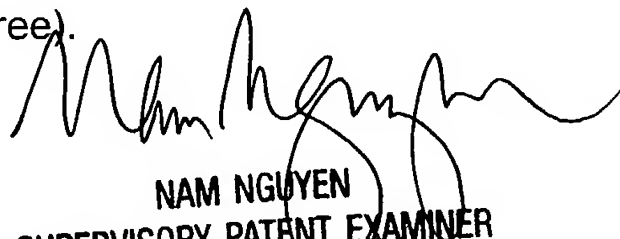
U.S. Pat. No. 5,543,032 Datta et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (571) 272-1341. The examiner can normally be reached on Monday-Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

blm
April 13, 2004


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700